

Solar Pumping Inverter User Manual



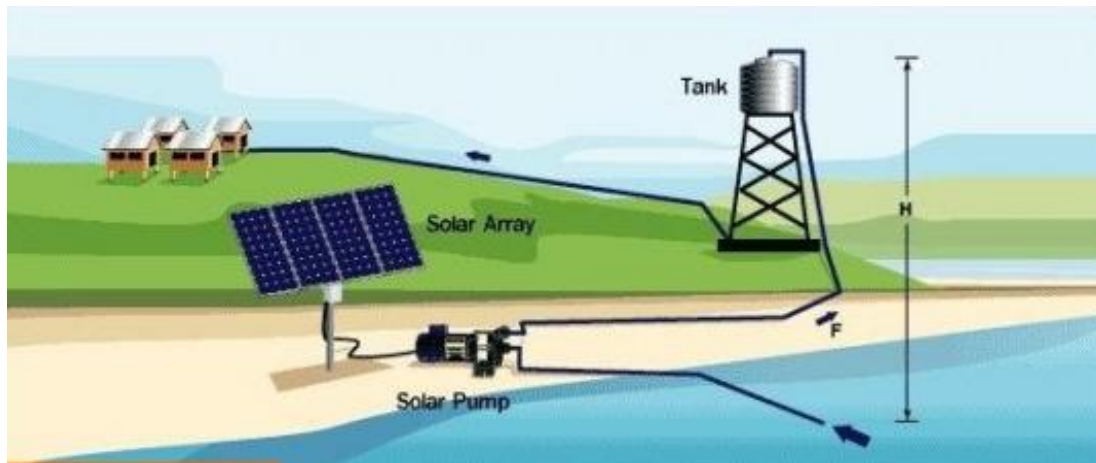
Introduction

Shenzhen Jaton Technology Limited is a New Energy company which focuses on R&D, manufacture and sales of solar power products. We have established a leading position among all domestic Chinese companies in the Off-Grid solar power system and Micro-grid since our establishment in 2006. Jaton fully participate in wind and solar hybrid power system for communication base station construction since 2006 and more 2000 base station systems operate normally at present. We are now providing not only general but also customized products and solutions for our customers.

Jaton is a national-level high-tech company with nine subsidiaries, whose business involves on-grid solar power generation system, off-grid solar power generation system, wind-solar hybrid power system, power optimizer, solar pump, solar lamps, etc. It strictly complies with ISO and CE standards and has successively passed the IEC, TUV, JET, MSC, EY105YS, SGS fire tests and gained the CQC Golden Sun Certificate and so on.

Certificates





Preface

Thank you very much for using the SI65 series of solar pumping inverter produced by Shenzhen Jatong Technology Limited.

Please be sure to read this manual carefully before installation and use in order to give full play to the performance of this product and ensure the safety of user and equipment.

Please preserve the manual in an orderly manner in order to subsequently facilitate the routine inspection and maintenance of the inverter and find out the cause of abnormality and treatment countermeasure.

If there are any puzzling questions or specific requirement during using, please contact the distributors of our company or directly keep in touch with the technology service center of our company.

The manual will be subject to change without any further notice.







Contents

Safety Instruction	4
Chapter 1 Products Introduction	7
1.1 Introduction of Solar Pumping System	7
1.2 Jaton Solar Pumping Inverter Features	7
1.3 Inverter Specification	8
Chapter 2 Installation and Wiring	11
2.1 Purchase Inspection	11
2.2 Dimension and Weight	11
2.3 Selecting the place of installation	12
Chapter 3 Operation Control	17
3.1 Panel Layout and Instruction	17
3.2 Setting and Operating	18
3.3 Function Parameter Definition	22
3.4 Debugging before First Operation	25
Chapter 4 Fault Diagnosis	27
4.1 Fault Code Description and Countermeasure	27
4.2 Fault Inquiry and Reset	28
Chapter 5 Service and Maintenance	30
5.1 Routine Inspection and Maintenance	30
5.2 Inspection and Replacement of the Damageable Part	31
5.3 Storage and Warranty	31
Warranty Card	33
Packing List	33
Jaton WARRANTY	34
Contact Jatton	36

Safety Instruction

The equipment is provided with several labels, some of them with a yellow background, which are related to safety issues. Make sure to read the labels and fully understand them before installing the equipment.

The symbols are:

	Equipment grounding conductor (Main grounding protective earth, PE)
	Alternate Current (AC) value
	Direct Current (DC) value
	Phase
 5minutes	To avoid risk of electric shock from energy stored in capacitor, please wait for at least 5 minutes to access the conductor part of input or output terminals of the inverter after it is disconnected from the output of PV panel and solar pump.
	Caution: The temperature of metal enclosure may be high during operation.



Disposal: Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities. Contact your local government for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.

● Purchase Inspection



1. Never install if you find inverter damage or lack of component, or else it will cause occurrence of accident.

● Installation



1. To ensure a good convective cooling effect, the inverter must be installed vertically with at least 10 cm space left in the top and bottom.
2. It's suitable for indoor and outdoor installations. Install it in the indoor location which is possessed of ventilation opening or ventilating device. It is forbidden to install where exposes directly to the sunlight.
3. Do not let the drilling remains fall into the inverter fin or fan during installation in case that heat dissipation is effected.
4. No user serviceable parts inside.
5. It can apply with all types of PV panel; the systems can operate with or without earthing.

● Connection



1. Connection job must be performed by qualified electric professionals, or else it will cause electrocution or fire.
2. Please confirm that input power has already been cut off before connection, or else it will cause electrocution or fire.
3. Earth terminal must be reliably grounded, or else the inverter shell will have a danger of being electrified.
4. The type selection of PV array, motor load and inverter must be reasonable, or else the equipment will be damaged.
5. When the photovoltaic array is exposed to light, it supplies a D.C. voltage to the PV inverter.



1. Please use the fasten terminal of the specified torque, or else it will cause fire.

2. Do not connect the output terminal of the inverter to the capacitor and phase-advanced LC/RC noise filter. It is recommended to use the output reactor when the distance between the inverter and motor load exceeds 100m.

● Running

Warning

1. Energize after confirming the correct connection or else it will damage the inverter or cause fire.
2. Do not modify the connection during electrifying, or else it will cause electrocution.
3. Don't block any of the ventilation openings.

Caution

1. Adjust partial control parameters according to the steps indicated by the manual before its first running. Do not change the control parameters of the inverter randomly, or else it will cause damage to the equipment.
2. Because the heat sink's temperature is high during running, do not touch it for a long time, or else it will cause burn.
3. In the condition of altitude over 1000m, the inverter should be derated for use, that is, output current will be de-rated by 10% at every 1500 m increment of height.

● Others

Warning

1. Maintenance and inspection must be performed by the qualified electric professionals.
2. Do not dismantle the inverter during electrifying. Conduct maintenance and inspection at least 5 minutes after the power off.
3. It is absolutely forbidden to reconstruct the inverter by oneself, or else it will cause personnel injury or equipment damage.
4. Treat the inverter as industrial waste when processing the abandoned inverter. It is possible that the electrolytic capacitor will explode during incineration and that part of components will produce toxic and harmful gas.
5. Pollution degree classification: Pollution degree 3.

Chapter 1 Products Introduction

1.1 Introduction of Solar Pumping System

Solar pumping systems produced by Jaton can be applied to daily use (underground water), agricultural irrigation, forestry irrigation, desert control, pasture animal husbandry, water supply for islands, wastewater treatment engineering, and so on. In recent years, with the promotion of the utilization of new energy resources, solar pumping systems are more and more used in municipal engineering, city centre squares, parks, tourist sites, resorts and hotels, the landscapes and fountain systems in the residential areas.

The system is composed of a solar array, a pump and a solar pumping inverter (see figure 1-1). Based on the design philosophy that it is better to store water than electricity, there is no energy storing device such as storage battery in the system.

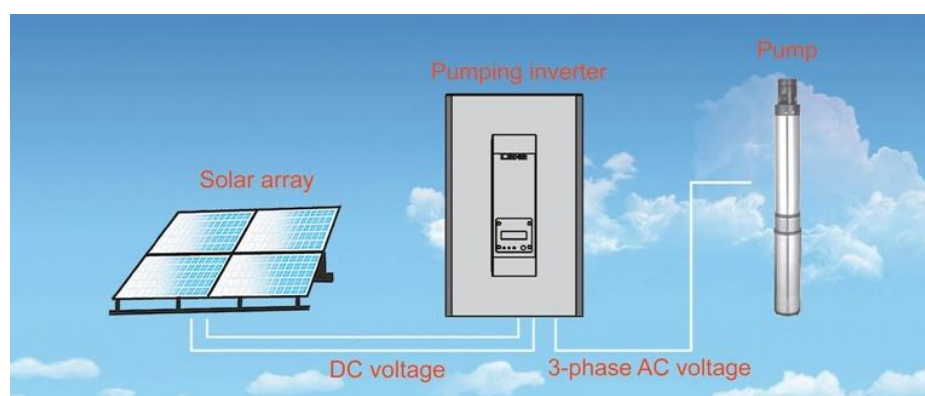


Fig. 1-1 Structure of solar pumping system

The PV array, an aggregation of many PV modules connected in series and in parallel, absorbs sunlight radiation and converts it into electrical energy, providing dynamical power for the whole system. The pumping inverter controls and adjusts the system operation and converts the DC produced by the PV array into AC to drive the pump, and adjusts the output frequency in real-time according to the variation of sunlight intensity to realize the maximum power point tracking (MPPT). The pump, driven by 3-phase AC motor, can draw water from the deep wells or rivers and lakes to pour into the storage tank or reservoir, or directly connect to the irrigation system, fountain system, etc. According to the actual system demand and installation condition, different types of pumps such as centrifugal pump, axial flow pump, mixed flow pump or deep well pump can be used.

1.2 Jaton Solar Pumping Inverter Features

Based on many years of development and experiment, the self-developed pumping inverter (figure 1-1) by our company has the following features: Adopting the proposed dynamic VI

maximum power point tracking (MPPT) control method which has independent intellectual property; Fast response speed and stable operation; Better than the conventional methods which may lead to the problems including poor tracking performances, unstable operation or even damaging water hammer effects when the irradiation on the array changes rapidly.

- Digital control with full automatic running, data storage and complete protective function

- The SI series of solar pumping inverter is produced to drive solarpump, it is more professional and stably.

- The main components of the SI65 series of solar pumping inverter are come from famous suppliers.

components	suppliers	country
IGBT	module	Infineon
Capacitance	NCC	Japan
DSP	TI	America

- Option of up and down water level detection and control circuit is available.



- Protection level IP65 (machine type's rated power less than 22 kW); ambient temperature for using: -10 ~ +50°C.

- Protective class: Class I; Overvoltage category PV: OVC II.

1.3 Inverter Specification

Label and Type Description

Product label is stick to the right side of outer casing, which contains the important information such as product series, voltage, power grade and SW and HW version that'll provide important basis for product application, maintenance and after service.

DC INPUT	
PV-voltage range:	250-900V ==
Rated DC voltage:	580V ==
PV-voltage range,MPPT:	500-680V ==
Max,DC-current:	12A
AC OUTPUT	
Rated AC power:	5500W
Rated voltage:	AC 3PH 380V
Max.AC-current:	3*13A
Frequency range:	0~50Hz/60Hz
Temperature range:	-25°C~60°C
IP Code :	IP65
Protection class I	
SOLAR PUMPING INVERTER	
Model:SPRING 5500	
 	
MADE IN CHINA	

SI65-SL-R55

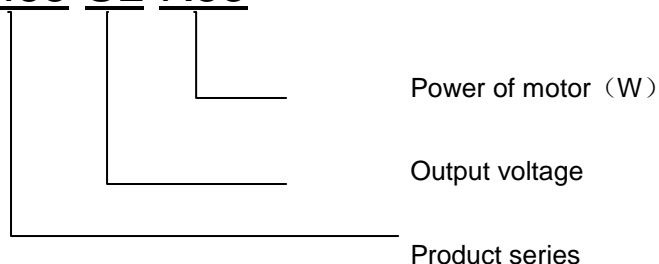


Fig. 1-2 Product nameplate and type description



Caution: Do not tear off the product's nameplate label.

Product Specification and Technical Index

Inverter Model	MAX Input String Number	Start Voltage (Vdc)	MAX DC Input Voltage (Vdc)	Recomm. MPPT Voltage Range (Vdc)	Rated Output Power (W)	MAX Output Current (A)	Output Frequency (Hz)	Output Voltage (Vac)
SI65-SL-R55	1	80	450	100~400	550	5	0~50/60	220V Single Phase
SI65-SLA-R55	1	80	450	100~400	550	5	0~50/60	
SI65-SL-R75	1	120	450	150~400	750	6.3	0~50/60	
SI65-SLA-R75	1	120	450	150~400	750	6.3	0~50/60	
SI65-SL-1R1	1	120	450	150~400	1100	8.6	0~50/60	
SI65-SLA-1R1	1	120	450	150~400	1100	8.6	0~50/60	
SI65-SL-1R5	1	120	450	200~400	1500	10	0~50/60	
SI65-SLA-1R5	1	120	450	200~400	1500	10	0~50/60	
SI65-SL-2R2	1	200	450	280~400	2200	14	0~50/60	
SI65-SLA-2R2	1	200	450	280~400	2200	14	0~50/60	
SI65-TL-R55	1	80	450	120~400	550	4	0~50/60	220V Triphase
SI65-TL-R75	1	120	450	150~400	750	5	0~50/60	
SI65-TL-1R1	1	120	450	150~400	1100	6	0~50/60	
SI65-TL-1R5	1	120	450	200~400	1500	7	0~50/60	
SI65-TL-2R2	1	200	450	280~400	2200	11	0~50/60	
SI65-TL-2	2	250	900	500~680	3000	8	0~50/60	380V Triphase
SI65-TL-4	2	250	900	500~680	4000	10	0~50/60	
SI65-TL-5R5	2	250	900	500~680	5500	13	0~50/60	
SI65-TL-7R5	3	250	900	500~680	7500	18	0~50/60	
SI65-TL-9R2	3	250	900	500~680	9200	21	0~50/60	
SI65-TL-11	3	250	900	500~680	11000	24	0~50/60	
SI65-TL-13	6	250	900	500~680	13000	28	0~50/60	
SI65-TL-15	6	250	900	500~680	15000	30	0~50/60	
SI65-TL-18R5	6	250	900	500~680	18500	39	0~50/60	
SI65-TL-22	6	250	900	500~680	22000	45	0~50/60	
SI54-TL-26	1 (via combiner)	250	900	500~680	26000	54	0~50/60	
SI54-TL-30		250	900	500~680	30000	60	0~50/60	

SI54-TL-37	box)	250	900	500~680	37000	75	0~50/60	
SI54-TL-45		250	900	500~680	45000	91	0~50/60	
SI54-TL-55		250	900	500~680	55000	112	0~50/60	
SI54-TL-75		250	900	500~680	75000	162	0~50/60	



Caution: Please be sure to select the appropriate model according to the PV array and motor load.



Caution: High-power machine model uses multiple-channel DC input structure.

The input power in the above table indicates total multi-channel input power; maximum DC current input should not exceed 15A.

Chapter 2 Installation and Wiring

2.1 Purchase Inspection

Our company has high quality assurance system in product manufacturing, package, etc. If any abnormality is found, please immediately contact the distributors of our company or directly keep in touch with the technology service center of our company. We will solve the problems for you immediately. Once you get the product, please confirm the following items:

Inspection item	Inspection method	Consistency with ordered
product		Inspect the product's
nameplate label		Damage or exfoliation
phenomenon		Inspect whole appearance
Completeness of main machine		and accessories

2.2 Dimension and Weight

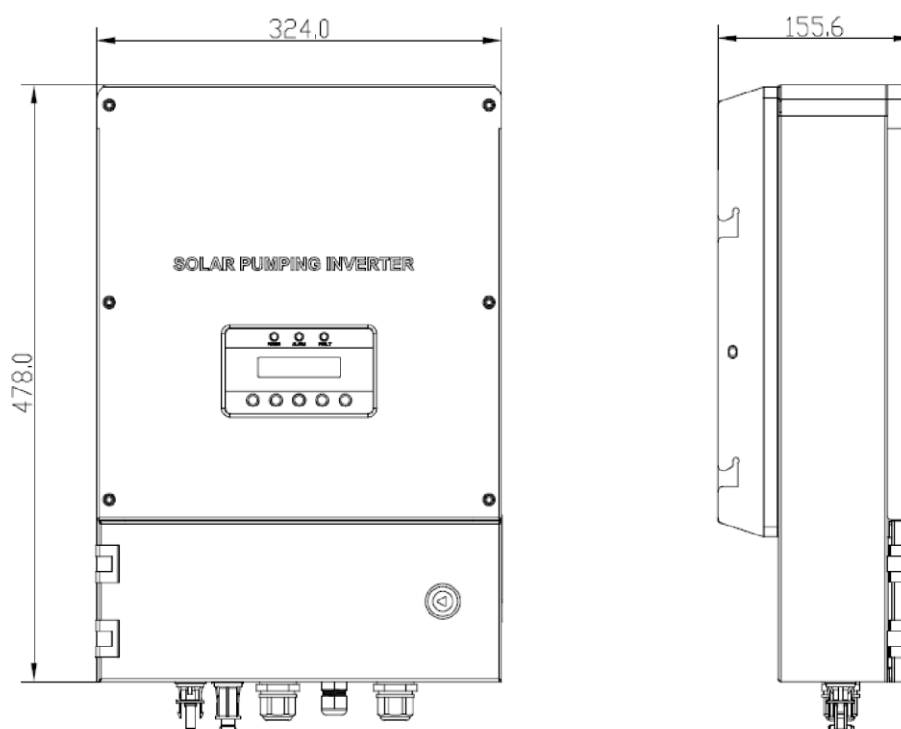


Fig. 2-1 Product appearance and installation dimension

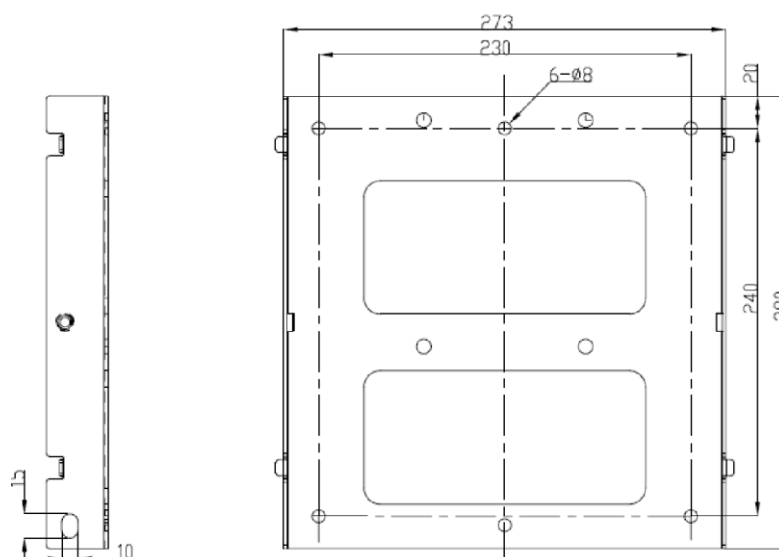
Inverter Model	Protection Level	Weight (kg)	Pack Size (mm)		
			Length	Width	Height
SI65-SL-R55	IP65	5	405	297	147
SI65-SLA-R55	IP65	5	405	297	147
SI65-SL-R75	IP65	8	405	297	147
SI65-SLA-R75	IP65	8	405	297	147
SI65-SL-1R1	IP65	8	405	297	147
SI65-SLA-1R1	IP65	8	405	297	147
SI65-SL-1R5	IP65	10	405	297	147

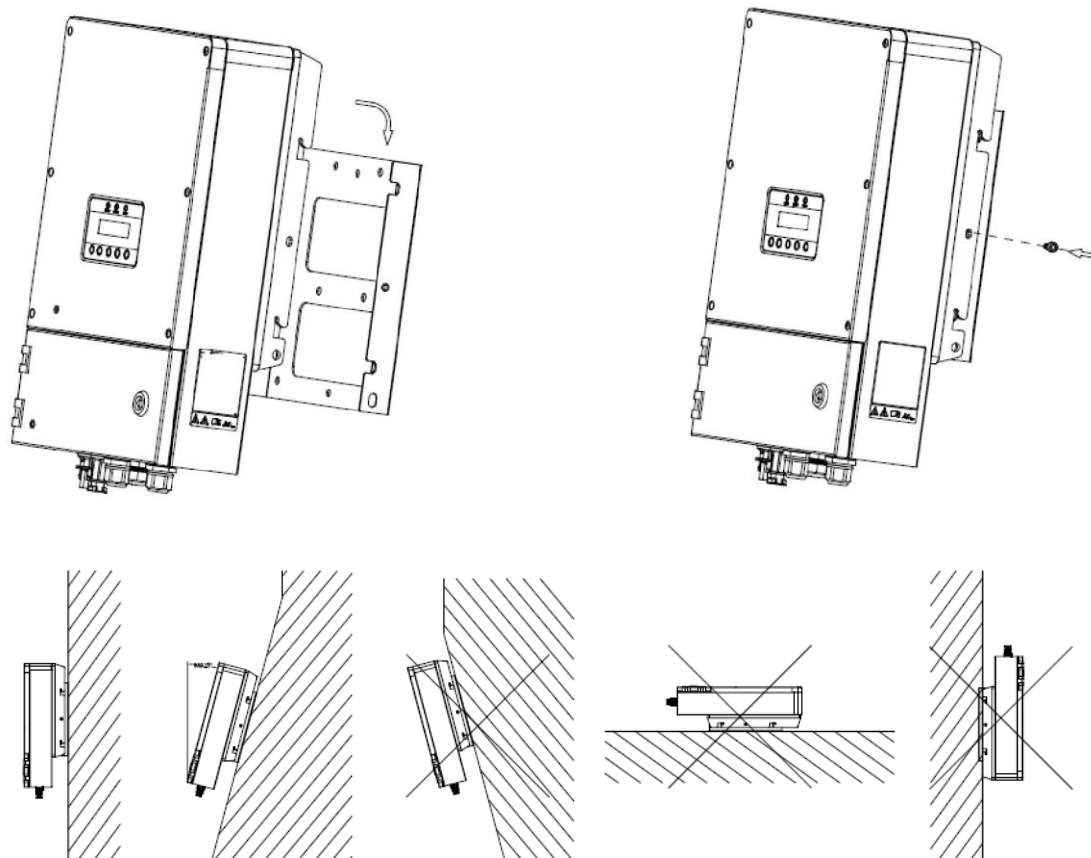
SI65-SLA-1R5	IP65	10	405	297	147
SI65-SL-2R2	IP65	10	405	297	147
SI65-SLA-2R2	IP65	10	405	297	147
SI65-TL-R55	IP65	5	405	297	147
SI65-TL-R75	IP65	8	405	297	147
SI65-TL-1R1	IP65	8	405	297	147
SI65-TL-1R5	IP65	10	405	297	147
SI65-TL-2R2	IP65	10	405	297	147
SI65-TL-2	IP65	14	478	325	155
SI65-TL-4	IP65	14	478	325	155
SI65-TL-5R5	IP65	15	478	325	155
SI65-TL-7R5	IP65	15	563	346	148
SI65-TL-9R2	IP65	15	563	346	148
SI65-TL-11	IP65	15	563	346	148
SI65-TL-13	IP65	16	533	405	190
SI65-TL-15	IP65	16	533	405	190
SI65-TL-18R5	IP65	22	533	405	190
SI65-TL-22	IP65	22	533	405	190
SI54-TL-26	IP54	30	533	405	190
SI54-TL-30	IP54	30	533	405	190
SI54-TL-37	IP54	30	533	405	190
SI54-TL-45	IP54	38	600	465	350
SI54-TL-55	IP54	38	600	465	350
SI54-TL-75	IP54	50	626	508	363





Caution: Most of SI65 series machine types are to be wall mounted. Please ensure that the mounting backplane can support the weight of the inverter.

2.3 Selecting the place of installation

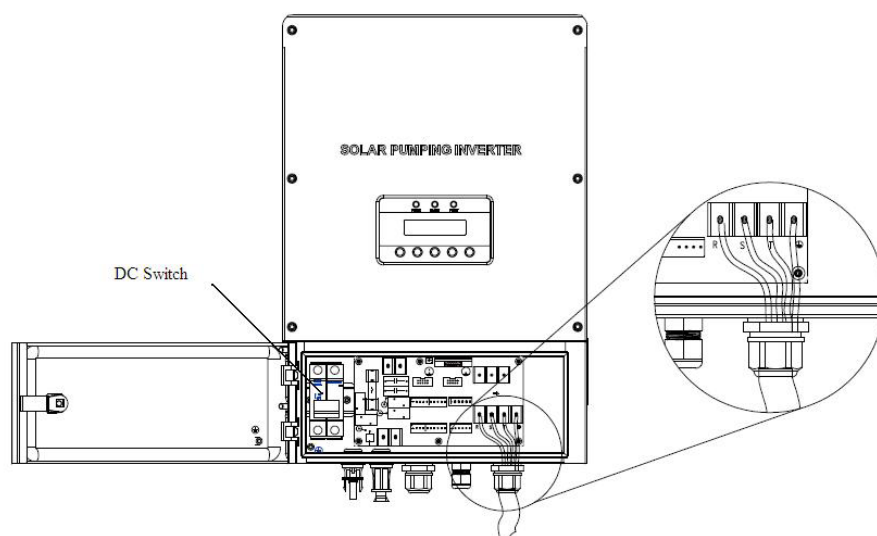




 Caution: Please identify with the plug to ensure the exact locations of the DC input “PV+” and “PV-” sockets for different model.

 Caution: Please ensure the AC output wiring based on the marks of the sockets.

Wiring Diagram



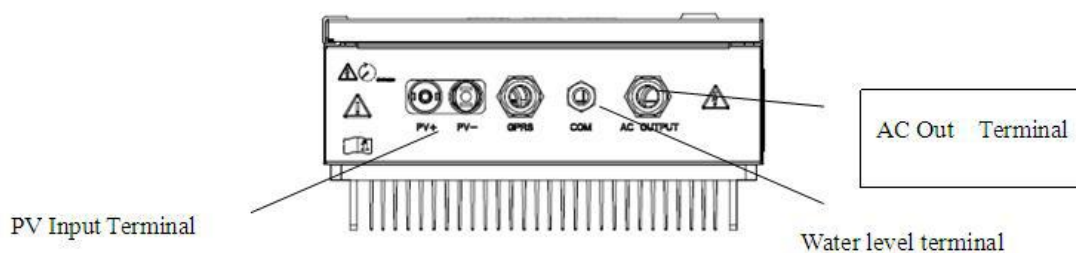
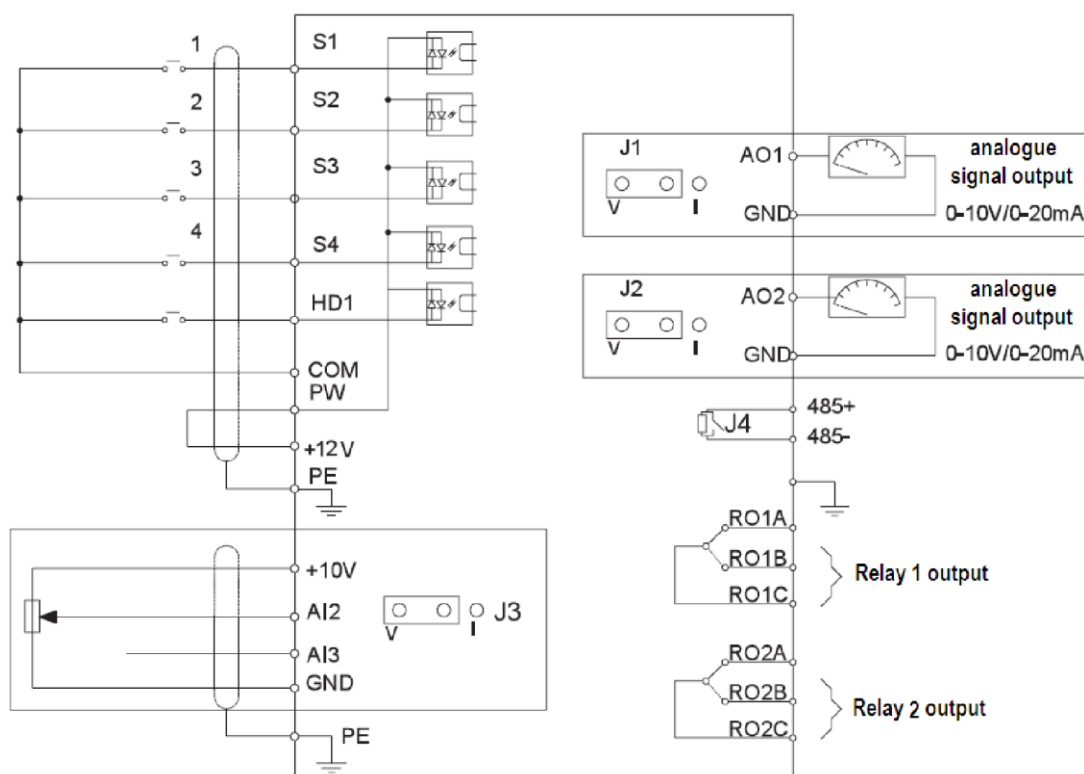


Fig. 2-2 SI65 wiring diagram



A/O terminals' wiring diagram

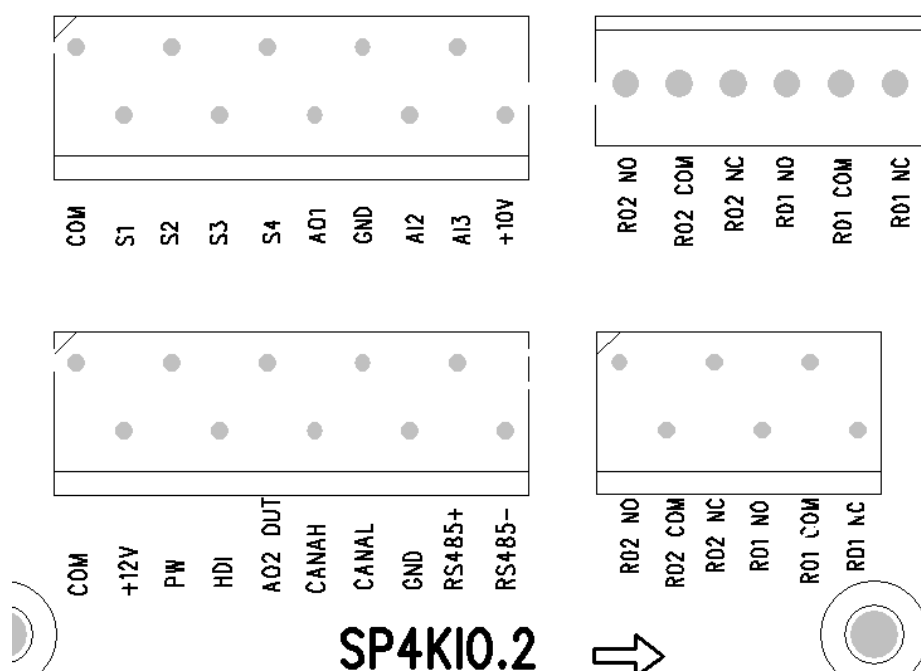


Fig. 2-3 A/O terminals

Socket	Terminal	description
DC input	PV+	To PV array positive
	PV-	To PV array negative
AC output	PE	To Earth
	U	To pump U phrase
	V	To pump V phrase
	W	To pump W phrase
Water level sensor(digital)	+12V	Power for water level sensor
	COM	The GND to +12V
	S1	Auto start
	S2	Water full(digital signal)
	S3	Water lack(digital signal)
Water level sensor(analogue)	+10V	Power for water level sensor
	GND	The GND to +10V
	AI2	Water full(analogue signal)
	AI3	Water lack(analogue signal)
	RS485+	485 communication
	RS485-	485 communication
	CANAH	CAN communication
	CANAL	CAN communication



Caution: To ensure normal operation of the system, it is recommended to select a suitable wire size according to the following table.

Recommended Wire Size Table

model	Recomm-e nded output current(A)	Recommended output voltage(V)	length ≤ 30m	length≤ 60m	length ≤ 90m	length ≤ 120m	length ≤ 150m	length ≤ 180m	length ≤ 210m
SI65-SL-R5	4	3HP 220V	0.75	1.5	1.5	2.5	2.5	4	4
SI65-SL-R75	5	3HP 220V	0.75	1.5	2.5	2.5	4	4	6
SI65-SL-1R1	6	3HP 220V	1	1.5	2.5	4	4	4	6
SI65-SL-1R5	7	3HP 220V	1	2.5	2.5	4	4	6	6
SI65-SL-2R2	11	3HP 220V	1.5	2.5	2.5	6	6	6	6
SI65-TL-3	8	3HP 380V	1.5	2.5	2.5	6	6	6	6
SI65-TL-4	9	3HP 380V	1.5	2.5	2.5	6	6	6	6
SI65-TL-5R5	13	3HP 380V	2.5	2.5	4	6	6	6	6
SI65-TL-7R5	18	3HP 380V	2.5	4	6	6	10	10	10
SI65-TL-9R2	21	3HP 380V	4	4	6	10	10	10	10
SI65-TL-11	24	3HP 380V	4	6	10	10	10	16	16
SI65-TL-13	28	3HP 380V	6	6	10	10	10	10	10
SI65-TL-15	30	3HP 380V	6	6	10	10	16	16	16
SI65-TL-18R5	39	3HP 380V	6	10	10	16	16	25	25
SI65-TL-22	45	3HP 380V			10	16	16	25	25

SI54-TL-26	54	3HP 380V			10	16	16	25	25
SI54-TL-30	60	3HP 380V			10	16	25	25	35
SI54-TL-37	75	3HP 380V			16	25	25	35	35
SI54-TL-45	91	3HP 380V				25	35	35	50
SI54-TL-55	112	3HP 380V					35	50	50

Units: mm²

Prompt: Ambient temperature condition for the above-recommended wire size is

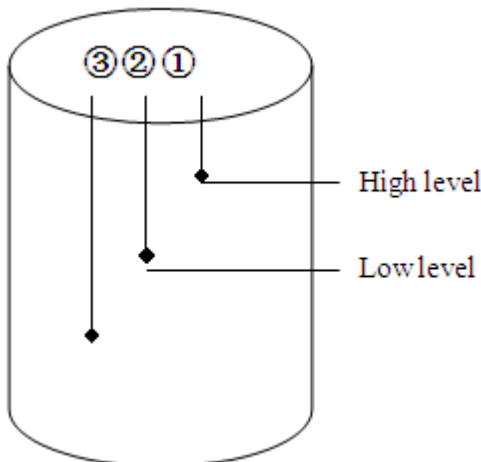
≤50° C.



Prompt: High-power wall-mounting machine model uses multi-channel DC input.

Wire size of DC of each channel is selected and used as per the recommendation in the above table.

Instruction of Float Water Level Switch

	Description
	<p>1.The water level sensor is made up of three bareness wires,</p> <p>2. When the water level of the cistern is high or the water level of the namma is low, the solar pumping inverter run; When the water level of the cistern is low or the water level of the namma is high, the solar pumping inverter stop.</p> <p>3.The water sensors must be:</p> <p>①signal 1 shortest</p> <p>②signal 2 medium</p> <p>③signal 3 longest</p>



Caution: When use the water level sensors, Please connect high level signal wire to A/O terminals S2 and COM; connect low level signal wire to A/O terminals S3 and COM (see Fig.2-3).

Chapter 3 Operation Control

3.1 Panel Layout and Instruction

Solar pumping inverter uses LCD display operating panel which is shown as the figure below, including 3 LED lamps, LCD display and 5 keys.

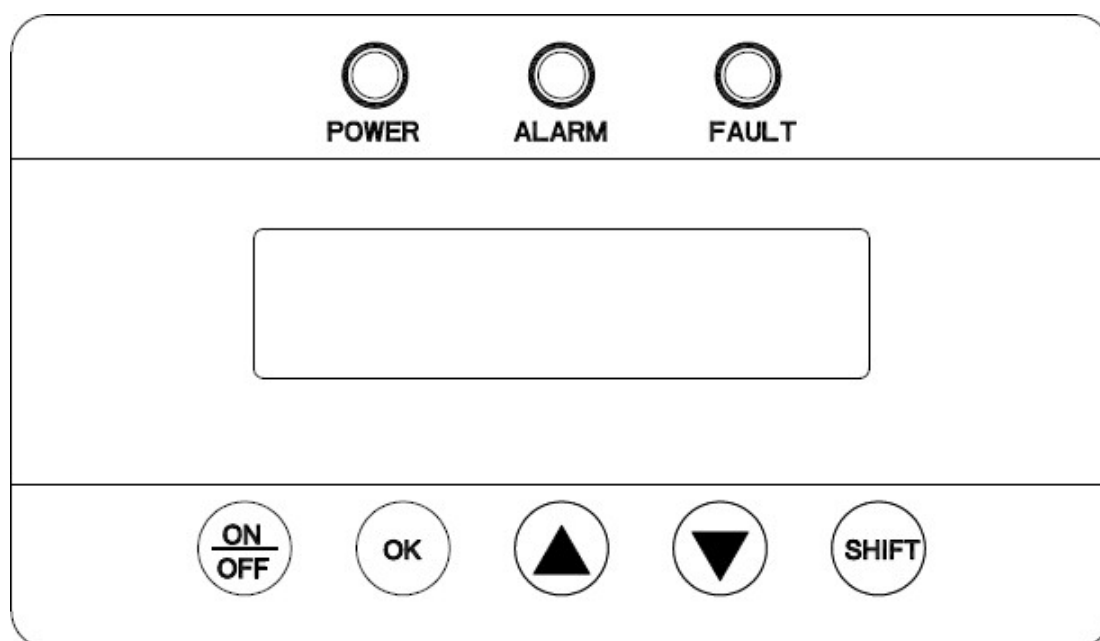







Fig. 3-1 Keyboard layout and name of each part

Indicator light and	key	Function Description	
POWER	Running indicator light	Green	Bright: Inverter is running
ALARM	Alarm indicator light	Yellow	Bright: Inverter is alarm
FAULT	Fault indicator light	Red	Bright: System fault
	Run /Stop key	1. Starting control for the inverter; 2. Stop control for the inverter for long press 2s.	
	Enter/Programming key	1. Confirm the content to be viewed or edited; 2. Confirm and save the parameter value when the parameter is edited; 3. Quit from the display status of the control parameter for long press 2s.	
	Increment key	1. Increase the parameter number or its value when the status of the control parameter is displayed;	
	Decrement key	1. Decrease the parameter number or its value when the status of the control parameter is displayed;	

	Shift key	1. Switch the digit to be edited during data editing. 2. Viewing the running data when the inverter is display in the main menu.
---	-----------	---

3.2 Setting and Operating

Inverter start-up and operation

Step 1: Ensure that the DC cable is connected correctly; unused DC plugs and AC terminal cover is sealed.

Step 2: Connect the solar pump to the AC output terminals (see Fig.2-2). If there have a AC switch between the pump and inverter (not suggest), Ensure the AC switch is ON.

Step 3: Connect the PV array to the PV input terminals before ensure the DC switch is OFF (see Fig.2-2).





Warning: It's absolutely forbidden to turn on the AC switch when the inverter is working, or may broken the inverter. The smart mind is turn off the DC switch first, wait 5 minutes at least to avoid risk of electric shock from energy stored in capacitor, then turn on the AC switch, and turn on the DC switch at last.

Ensure all the wires is corrected connect, turn on the DC switch, the LCD display and power light will bright; then the inverter will drive the pump for wait 60 seconds.



Caution: There are two operation modes in the product; the factory set is full-automatic operation:

1: Press  key to operate, the initial frequency value is determined by S00.10, and then modifies the output frequency by pressing Increment key or Decrement key. In this mode: it's need to press  key to operate and long press 2s to stop.

2: Full-automatic operation: the inverter will start automatically if the sunlight is strong enough, the output frequency will track automatically according to the sunlight. The control cell array will

export maximum power; in this mode, it isn't need to control the inverter, it will start automatically if the sunlight is strong enough and stop when the sunlight is weak. It could only view running data and parameter, and use DC switch to control the inverter if you want.

Once the solar pump inverter starts, it enters one of the following 3 states in turn:

Standby: The PV array can only provide just enough voltage to minimum requirements of the internal controller unit.

Try to working: When the PV array DC voltage is greater than 500V, the inverter will try to working.







Normal: when the inverter operates and the PV array DC voltage is greater than 500V, the inverter will work normally.


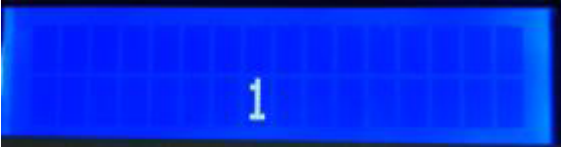

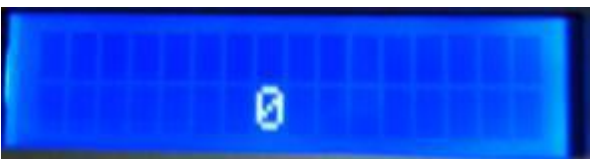







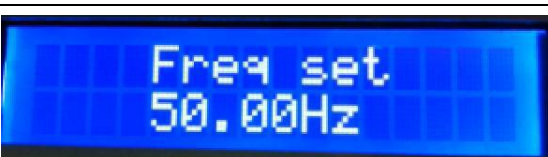






The Inverter will keep MPPT function and drive the solar pump when it is in normal operation. Maybe it will stop under the situation of low input DC-power, don't worry, it will automatically restart again when DC-power from the PV array is sufficient.



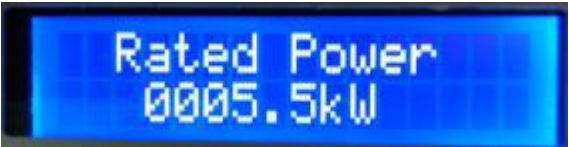




























Warning: The rated power of the pump exceed the inverter, it may broken the inverter; if the rated power of the pump match the inverter, it isn't need to edit the parameter; if the rated power of the pump not exceed the inverter, it is need to edit the parameter in following steps.

E.g. Inverter (7.5kW) drive the pump (5.5kW)

Operation	Description	Display
Initial status: non-historical data display		
	Enter the main parameter modification interface for long press 2s	 Represent: S00 parameter group
	Press OK key to enter the branch menu	 Represent: S00.00
	Press UP key to view the S00.01	 Represent: S00.01

	Press OK key to enter the S00.01(the factory set is 1)	 Represent: 1
	Edited it to 0(controlled by keyboard)	 Represent: 0
	Press to save the parameter value and display the next code number	 Represent: S00.03
	Return the main parameter modification interface for long press 2s	 Represent: S00 parameter group
	Long press OK for 2s to return to the initial status	 Represent: Working freq. 50.00Hz
	Long press ON/OFF key for 2s to stop the inverter.	 Represent: Set freq. 50.00Hz
	Enter the main parameter modification interface for long press 2s	 Represent: S00 parameter group
	Press the UP key to S02 group	 Represent: S02 parameter group
	Press OK key to enter the S02.01	 Represent: S02.01

 and 	Edited the rated power to 5.5kW	 Represent: 5.5kW
	Press OK turn to S02.02	 Represent: S02.02
 and 	Edited the rated current of the pump(it will write in pump)e.g.11.3A	 Represent: 11.3A
	Press to save the parameter value and return to the branch menu	 Represent: S00 parameter group
	Long press OK for 2s to return to the main menu	 Represent: S02 parameter group
	Press DOWN key to S00 parameter group.	 Represent: S00 parameter group
	Press OK key to enter the branch menu.	 Represent: S00.00
 or 	Press UP or DOWN key to view the S00.01	 Represent: S00.01
	Press OK key to enter the S00.01.	 Represent: 0

	Edited it to 1(controlled by terminals)	 Represent: 1
	Press to save the parameter value and display the next code number.	 Represent: S00.03
	Long press OK for 2s to return to the main menu.	 Represent: S00 parameter group
	Long press OK for 2s to return to the initialstatus.	 Represent: 50.00Hz
Turn off the DC switch,waiting the LCD display off, then turn on the DC switch, the inverter will auto-start to drive pump(5.5kW)		



Prompt: It can only view the control parameter during inverter operation. The control parameter cannot be modified until the inverter stops running.

3.3 Function Parameter Definition

Number	Name	Scope	Description	Factory set value
S00.01	Control mode	0 ~ 2	0: Controlled by keyboard (the LED off). 1: Controlled by terminal (the LED flash). 2: Controlled by communication (the LED light).	1
S00.03	Maximum output frequency	10Hz ~ 600Hz	S00.04 ~ 600Hz	50.00Hz
S00.04	Maximum	S00.06 ~ S00.03	S00.05 ~ S00.03	50.00Hz

	running frequency			
S00.05	Minimum Running frequency	0.00 ~ S00.04	0.00 Hz~ S00.04	0.00Hz
S00.06	Frequency set	0 ~ 11	0. Set by keyboard 1. Set by AI1 2. Set by AI2 3. Set by AI3	0
S00.10	Running frequency set	0.00 ~ S00.04	Only set in manual control model	50.00Hz
S00.11	Acceleration time	0.0 ~ 3600.0	0.0 ~ 3600.0s	22s
S00.12	Deceleration time	0.0 ~ 3600.0	0.0 ~ 3600.0s	10s
S02.01	Rated power of the motor	0.1 ~ 3000.0	0.1 ~ 3000.0kW	Set by model
S02.02	Rated frequency of the motor	0.01 ~ S00.03	0.01 ~ S00.03	50.00Hz
S02.04	Rated voltage of the motor	0 ~ 1200	0 ~ 1200V	Set by model
S02.05	Rated current of the motor	0.8 ~ 6000	0.8 ~ 6000A	Set by model
S05.01	S1 terminal function	0 ~ 63	0. null 1. Running in forward model 2. Running in reverse model 7. Fault reset 8. Run and stop 42. PV inverter forbidden	0
S05.02	S2 terminal function			
S05.03	S3 terminal function			
S05.04	S4 terminal function			

			43. Water full	
S07.00	Custom password	0 ~ 65535	You must enter the password when you want to view or edit parameter	0
S07.11	Temperature of the rectifier module	0 ~ 100.0℃		
S07.12	Temperature of the inverter module	0 ~ 100.0℃		
S07.27	Current fault type		0. null 1. IGBT Shortcut	0
S07.28	Fault type record 1 ~ 5		2. Inc over Current/Dec over Current/Con over Current	
S07.29			3. Inc over Volt/Dec over Volt/Con over Volt	
S07.30			4. Vbus low	
S07.31			5. Overload Tel 6. Overload VVVF	
S07.32			7. Scarce Phase Out 8. Inv Overtemp 9. Shortcut GND 1 10. Curr test Fault 11. Lack load	
			12. No Water 13. Water Full 14. Com Fault	









Prompt: Record is not made because of the under-voltage fault of input voltage

caused by the weakness of the sunlight intensity.

3.4 Debugging before First Operation

To ensure the efficient, reliable and stable operation of the solar pumping system, professional electric technician must set partial parameters of the inverter according to the system structure as following steps before first operation.

Steps	Debugging contents	Operating method
1	Modify the control mode	Modify the S00.01 value as 0. (in this mode, the inverter controlled by keyboard)
2	Modify the rated power of the motor	Modify the S02.01 value follow the motor (Rated power).
3	Modify the rated frequency of the motor	Modify the S02.02 value follow the motor (Rated frequency).
4	Modify the rated voltage of the motor	Modify the S02.04 value follow the motor (Rated voltage).
5	Modify the rated current of the motor	Modify the S02.05 value follow the motor (Rated current).
6	Confirm the motor wiring	<p>Modify S15.00 parameter value as 0. Modify S00.10 parameter value as 30.00. (in a shining day)</p> <p>Press the  key to run and observe water yield from the outlet.</p> <p>Long press  key to shut down and change the order of output connection.</p> <p>Press the  key to run and observe water yield from the outlet.</p> <p>Long press  key to shut down; select the wiring</p>

		method with larger water yield to ensure the pump's corotation.
7	Modify the minimum operating frequency	<p>Modify S00.10 parameter value as 10.00. Press  key to run.</p> <p>Observe the effluent of the water outlet.If there is no effluent in the outlet, press Increment key to slowly increase the output frequency.</p> <p>If there is effluent of the pump, record the operating frequency f.Modify the S00.05 parameter value as f (shutdown frequency).</p>
8	Set the operating mode of the inverter	<p>User sets S15.00 (operating mode) according to his own demand.0: Press  key to operate, the initial frequency value is determined by S00.10, and then modifies the output frequency by pressing Increment key or Decrement key.</p> <p>1: Full-automatic operation: the inverter will start automatically if the sunlight is strong enough, the output frequency will track automatically according to the sunlight. The control cell array will export maximum power.</p>
9	Modify the control mode	Modify the S00.01 value as 1. (in this mode, the inverter controlled by terminals)



Caution: Please do not modify the control parameters of the inverter randomly,or else it will cause abnormal working of the system.

Chapter 4 Fault Diagnosis

4.1 Fault Code Description and Countermeasure

SI65 series solar pumping inverter has perfect protection. When the system fault occurs, the inverter will take protection measures: general protection measure is to stop driving signals output of the motor (breakaway) immediately while the restart is forbidden for a certain period of time.

It will automatically switch to the fault display unit when fault or protection occurs. The fault code will be displayed in the middle of the LCD and flash. You can cut off the input power supply and get electricity until the internal power supply is cut. If the fault still exists after reset, please contact the manufacturer and make relevant processing.

After the fault or protection to be reset is eliminated, the inverter will conduct automatically a time-delayed restart. At this time the fault number will appear in the left side of the LCD. The right will display the countdown of the restart, when the countdown is 0, fault display unit will disappear automatically and operating status data will be displayed.

Code	Code description	Possible reason	Countermeasures
Power off	PV array voltage is lower to the start value Too weak sunlight intensity		When PV voltage is upto the start value, pumping system will automatic start.
Inc over Volt Dec over Volt Con over Volt	Over-voltage	Too high input voltage	Inspect PV array voltage
Vbus low	Under-voltage	Too low input Voltage Too weak sunlight intensity	Inspect PV array voltage.
Inc over Current Dec over Current Con over Current	Over-current	Too large pump load Low PV array voltage Too long motor wiring	Change low-power pump load Inspect PV array voltage Reduce the connection between inverter and motor.
Overload Tel	Too much power for the pump	The rated power of the pump not match the inverter	Reduce the highest operating frequency of the inverter.
Overload	Over load for the inverter	The rated power of	Change a smaller power of

VVVF		the pump not match the inverter	the pump
IGBT shortcut	Over-current of the IGBT module	Shorted output or grounding Module damaged	Inspect the connection Turn to manufacturer for service
Inv Overtemp	Over-temperature of the IGBT module	Air duct blocked Too high ambient temperature	Clear the air duct or improve the ventilation condition
Scarce Phase Out	Output error	Error connection IGBT module damaged	Inspect the connection Turn to manufacturer for service
Shortcut GND 1	Shorted to the Ground	Error connection	Inspect the connection
Curr test Fault	CT fault	Device or circuit damaged	Turn to manufacturer for service
Lack load	pump running empty	Pumping empty,pump wire are all broken, pump is not match with inverter.	To check with water level,pump wire connection, pump rate is match with inverter capacity or not.
No Water	Too low of the water level	Pumping empty A/O terminals connection error	To check with water level A/O terminals connection
Water Full	Too high of the water level	Cistern full A/O terminals connection error	To check with water level A/O terminals connection
Com Fault	Communication fault	Device or circuit damaged	Restart Turn to manufacturer for service

4.2 Fault Inquiry and Reset

This series of inverters record the fault codes of the latest 5 times. Searching this information will help find the fault cause. Fault information is stored together with the control parameter, code numbers are S07.28~S07.32. Please refer to the keyboard operation method to search and find out relevant information.



Caution: Completely check up on the fault cause and eliminate it before reset. If it cannot be reset or goes wrong after reset, check up on the cause, because continuous reset will damage the inverter.



Caution: Delay 5 minutes to reset during overload and overheat protection.

Chapter 5 Service and Maintenance

5.1 Routine Inspection and Maintenance

Affected by ambient temperature, humidity, dust, vibration and internal device aging of the inverter, the inverter will appear some potential problems during operation. To make the inverter run stably for longer time, a periodic inspect must be exerted every year.

Requirement of Inspection and Maintenance

The inspection must be performed by professional technical personnel, if necessary, cut off power supply of the inverter first.

Avoid leaving the metal components in the inverter, or else it will cause damage to the equipment.

Electric insulation test has been made on the inverter before it is leaving factory, so the user doesn't have to carry on a withstand-voltage test.

If it is necessary to conduct insulation test on the inverter, all the input and output terminals must be reliably shorted. It is forbidden to conduct insulation test on single terminal. Use the 500V megohmmeter to conduct the test.

It is forbidden to use the megohmmeter to test in the control circuit.

When conducting insulation test on the motor, you have to dismantle the connection between motor and inverter.

Main Points for Inspection and Maintenance

Please use the inverter under environment recommended by this manual. Inspect and maintain as per the following table.

Inspect frequency		Inspection item	Inspection content	Judgment standard
Routine	Regular			
√		Running environment	1. temperature, humidity 2. dust, gas	1. Temperature < 50°C. 2. Humidity < 90%, no dew condensation. No peculiar smell, flammable, explosive gas.
	√	Cooling	1. Installation	1. Excellent ventilation in

		system	environment	installation environment.
			2. Radiator	2. Radiator air duct not blocked.
√		Inverter body	1. Vibration, temperature rise. 2. Noise 3. Lead, terminal	1. Stable vibration, normal temperature of the shell. 2. No abnormal noise and peculiar smell. 3. Fastening screw not loosen.
√		Motor	1. Vibration, temperature rise. 2. Noise	1. Steady running and normal temperature. 2. No abnormal and uneven noise.
√		Input and output parameter	1. Input voltage 2. Output current	1. Input voltage in the specified scope. 2. Output current under the rated value.

5.2 Inspection and Replacement of the Damageable Part

Filter Capacitor

Pulsating current of the main circuit will influence the performance of the aluminum electrolytic filter capacitor, of which the degree will depend on the ambient temperature and application condition. The inverter used under normal condition should replace its electrolytic capacitor every 10 years. When the filter capacitor's electrolyte is leaking, safety valve bursting out or the capacitor main body expanding, replace it immediately.

Cooling Fan

Of SI65 series of pumping inverter, all the inverters above SI65 22kW have cooling fans inside. Cooling fan's service life is about 1, 5000 hours. If the fan appears abnormal noise or produces vibration, replace it immediately.

5.3 Storage and Warranty

Storage

If the storage is not used temporarily or stored for long time after purchasing, the following notice should be paid attention to.

Avoid placing the inverter in high temperature or humid place or where there is vibration and metal dust, and excellent ventilation should be ensured.

Inside filter capacitor performance of the inverter will decline for long-time disuse. It is necessary to energize one time every 2 years to restore the performance of the filter capacitor and inspect the inverter function at the same time. It is necessary to increase the voltage through a DC power supply during energizing with power-on time not less than 5 hours.

Warranty

The warranty of this inverter is 2 years. When any fault or damage occurs on the product, within the warranty period, our company will provide free maintenance. After the warranty time, we can provide lifetime paid warranty service.

Certain maintenance charge should be considered during warranty period if the fault is caused by the following reason:

1. Fault caused by operating against the manual or surpass the standard specification
2. Fault caused by self fix and modification without permission.
3. Fault caused by poor preservation
4. Fault by using the inverter in abnormal function
5. Machine damage caused by fire, salt corrosion, gas corrosion, earthquake, storm, flood, lightning, abnormal voltage or other force majeure.



Prompt: Warranty only covers the body of the inverter.

Warranty Card

Client name		Contact person	
Client address		Telephone number	
Product type		Date of purchase	
Machine frame code		Warranty length (From the leaving factory day.)	
Distributor (Seal)			

Packing List

1. Main machine, 1
2. Operation manual(including warranty card), 1
3. Plug of the positive electrode of the PV array, 1
4. Plug of the negative electrode of the PV array, 1
5. Water level sensor plug, 1 (matching)

Jaton WARRANTY

Warranty Policy:

Warranty Period: The Jaton SI65 Series Solar pumping inverters provided by Shenzhen Jaton Tech. Co., LTD. (abbr. Jaton) have 24-month warranty period. The system accessories provided by Jaton have 12-month warranty period.

Warranty Time Start: From the date that you get goods from our distributors.

Warranty Evidence: The Purchasing Invoice from the distributors & Product Series No.

Note: Jaton will count from 2 months later according to ex-factory date as the warranty start time if client fails to provide the purchasing invoice and other documents.

Scope: Any damages that occur during the WARRANTY PERIOD will be evaluated by Distributor and Jaton to define its scope and responsibility.

Warranty Principles:

To provide better service to Jaton's end users, all Jaton's authorized distributors are requested to respond to end users' warranty claim, and the authorized distributors will replace any products or parts of the product during the warranty period proved to be defective in design or manufacture. The following cases will be excluded from the warranty (the Distributors are liable for investigation of the following):

- 1) "Warranty Card" not being sent back to distributor or Jaton.
- 2) Product modified or design changed or parts replaced not approved by Jaton
- 3) Modifications, changes, or attempted repairs and erase series number or seals by non Jaton's technician.
- 4) Incorrect installation or commissioning
- 5) Failure to observe the applicable safety regulations (G59-2.)
- 6) The Product has been improperly stored and damaged while being stored by the end user.
- 7) Transport damage, Painting scratch caused by shipping pumping. It should declare to insurance company as soon as containers unload with enough evidence.
- 8) Failure to observe the user manual, the installation guide, and the maintenance regulations

9) Incorrect use or inappropriate operation

10) Insufficient ventilation of the device

11) The maintenance procedures relating to such product have not been observed or performed to an acceptable standard.

12) Force majeure (e.g., lightning, overvoltage, storm, fire) Claims that go beyond the rights cited in the warranty principles, in particular claims for compensation for direct or indirect damages arising from the defective device, for compensation for costs arising from disassembly and installation, or loss of profits are not covered by Jaton's warranty, insofar Jaton is not subject to statutory liability.

Warranty Claim Procedure:

Please report defective devices with a brief error description to the Jaton's distributors. If we agree to a replacement, we generally send an equivalent replacement device according to model and age, the remainder of the warranty entitlement will be transferred to the replacement device. In this case, you do not receive a new certificate since your entitlement is documented at Jaton. The replacement will be packaged appropriately for transport and shipped out within 2 working days. The defective device is to be packed in this transport packaging for return transport to the distributor. If the on-site service of re-installation is necessary, the end customers need to negotiate with the distributors in advance. All warranty services in warranty period are free of charge.

Contact Jatón

Jaton Technology Limited

Add:zhuguang industrial Park,Xili town,Nanshan district,Shenzhen City China

Web:www.jatontec.com

Sales Email:nancy@jatontec.com

Service Email:supoort@jatontec.com

